

Using active fires to detect fires across vegetation types in Poland



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Poland has witnessed an increasing trend in number of fires over the last decades. Statistics provided by the Joint Research Centre (JRC Technical Reports 'Forest Fire in Europe, Middle East and North Africa 2012') showed that Poland is a third European country after Portugal and Spain in number of fires reported annually. To date, fire monitoring in Poland is explicitly conducted using ground reporting and measurements through generating burn scars contours. Ground data collection is usually time consuming and cost ineffective especially at large scale as national and sub-national levels. It is important, therefore, to examine whether the Earth Observation data, which is recognized as a valuable source of information about fire events, can support the fire monitoring system in Poland.

We also performed the cross-comparison of results derived from different satellite sensors. The national CORINE land cover 2006 map was used to detect locations vulnerable to burning and land cover types most frequently affected by fires.

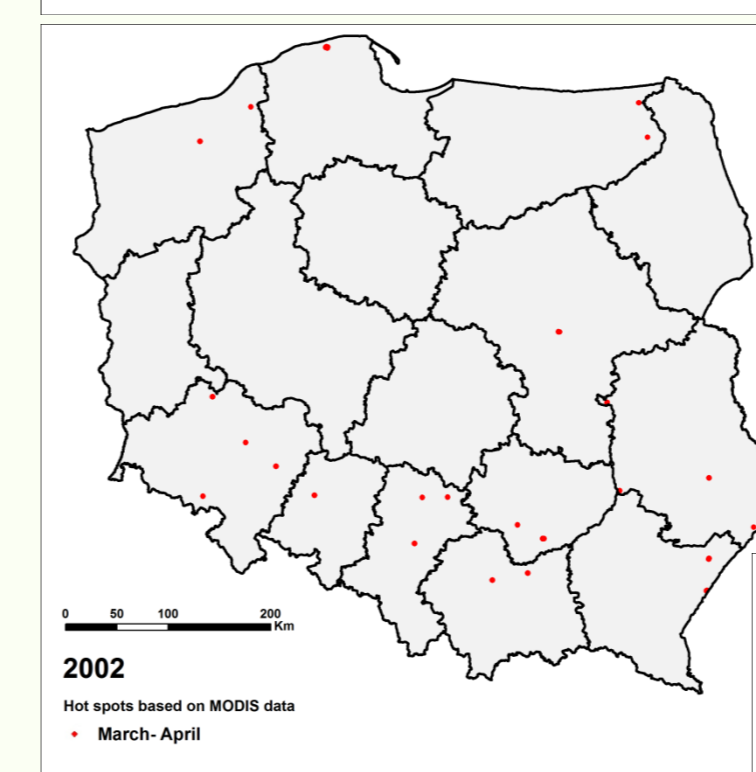
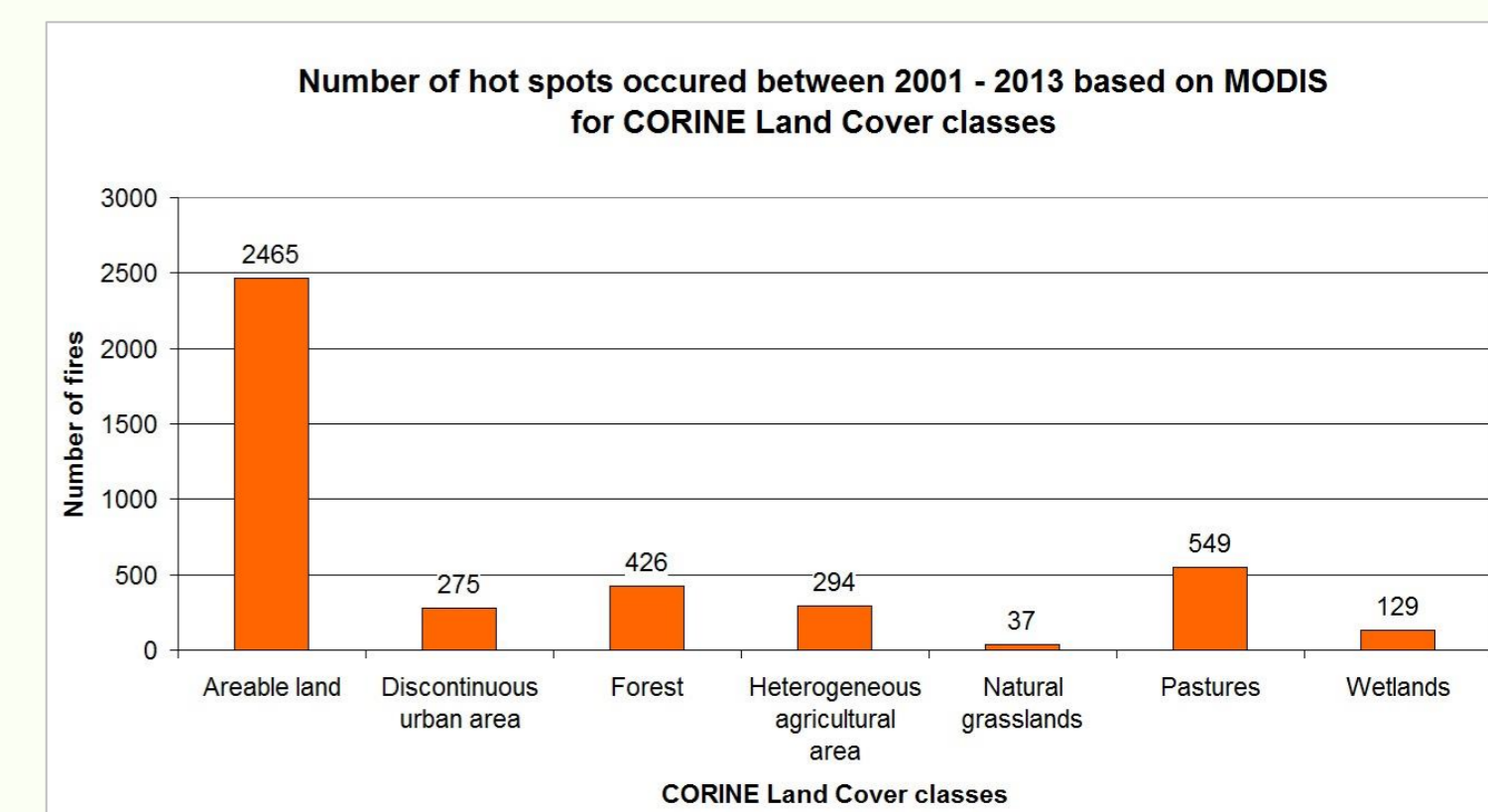
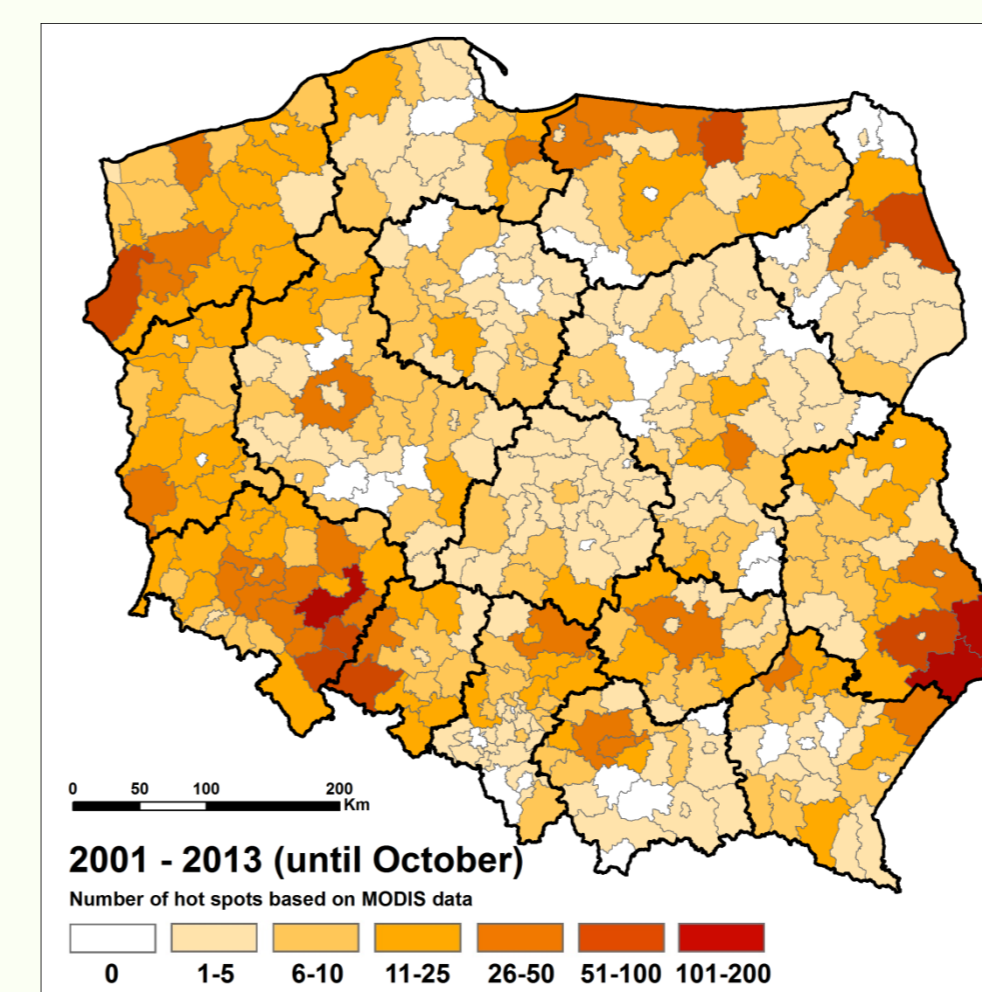
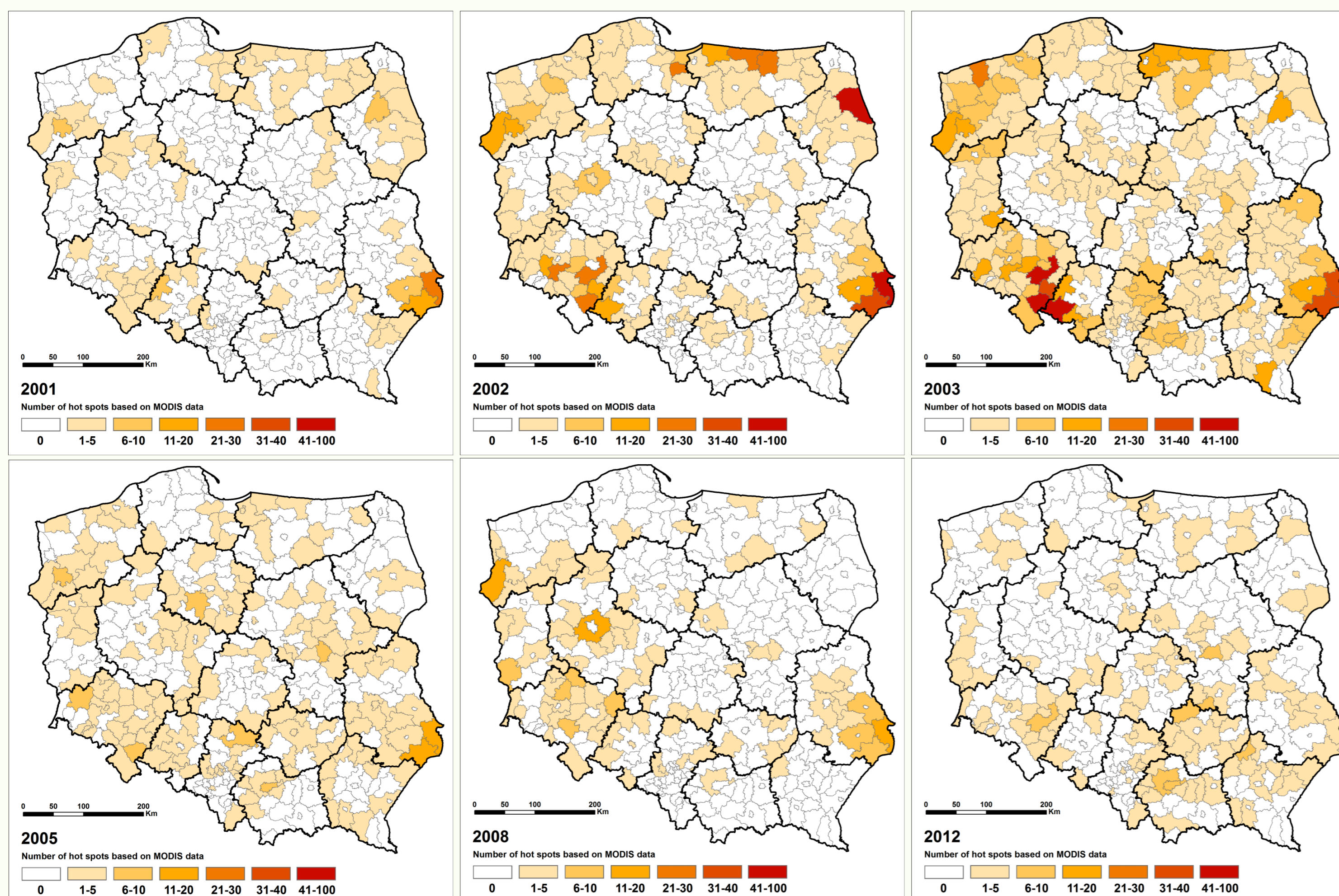
In addition, the research will address the following research questions:

- Quantification of the spatio-temporal pattern of fires and investigation of changes in fire regime
- Investigation of fire intensity and identification of areas particularly vulnerable to spring burning
- Estimation of the amount of GHG released through biomass combustion using 'top down' approach

We use active fire products derived from satellite sensors: MODIS/Terra-Aqua (NASA LANCE-FIRMS) and ATSR (ATSR World Fire Atlas Algorithm 1&2) to deliver information on spatial and temporal distribution of fires in Poland at national and sub-national levels).

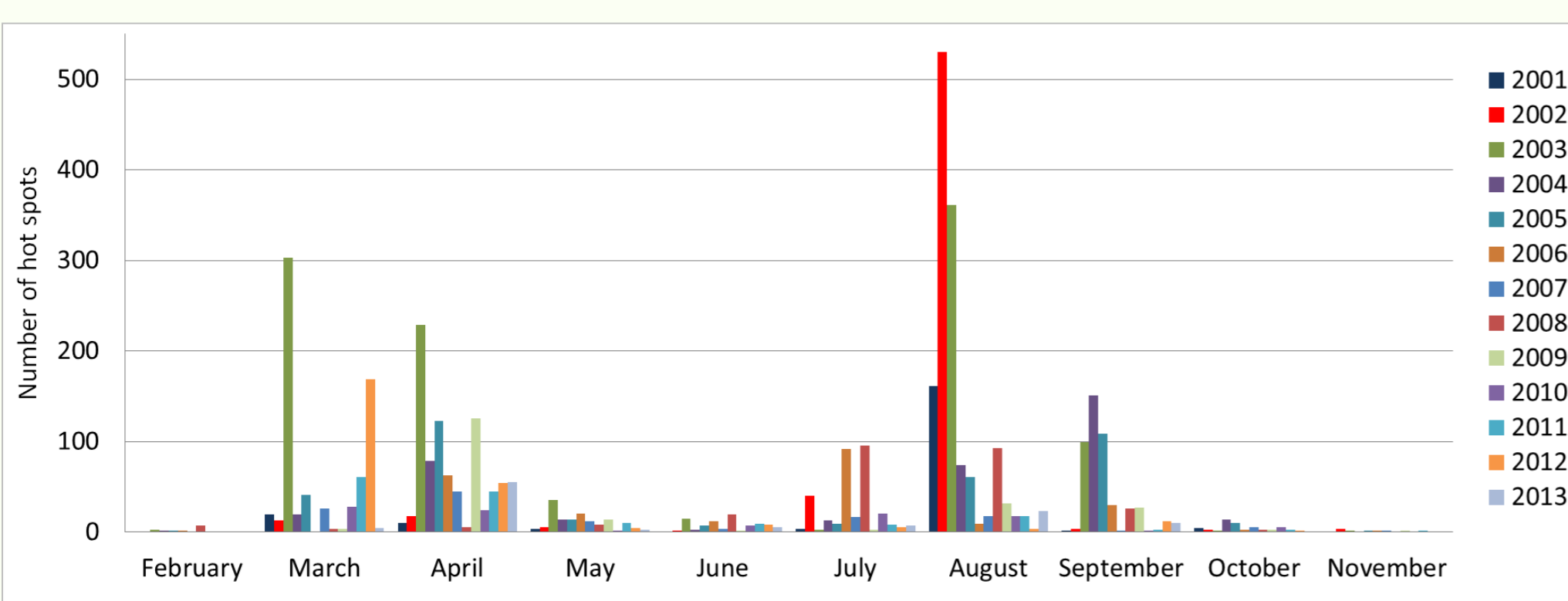
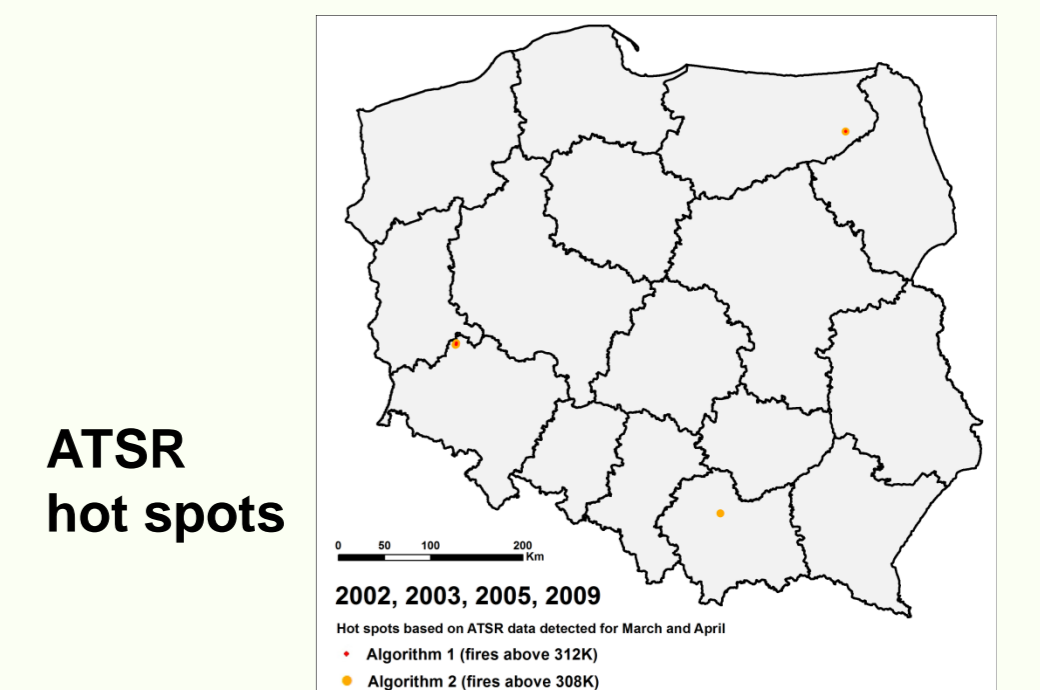
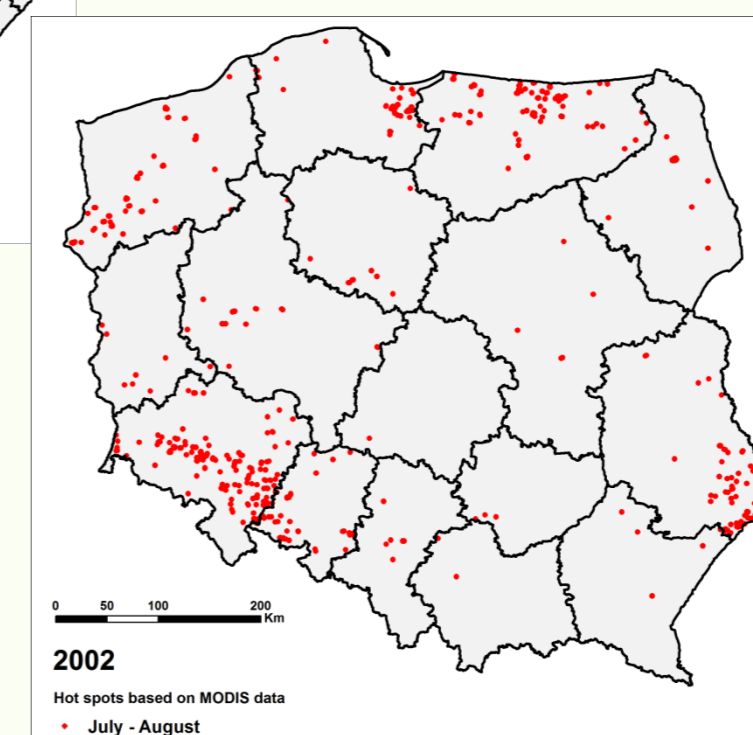
In the next step, the information on fire distribution obtained from satellite sensors will be correlated with *in situ* data available from the National Forest Fire Information System maintained by the Forest Research Institute in Sękocin.

Spatial distribution of MODIS hot spots (nominal and high confidence) 2001 - 2013 (until October)

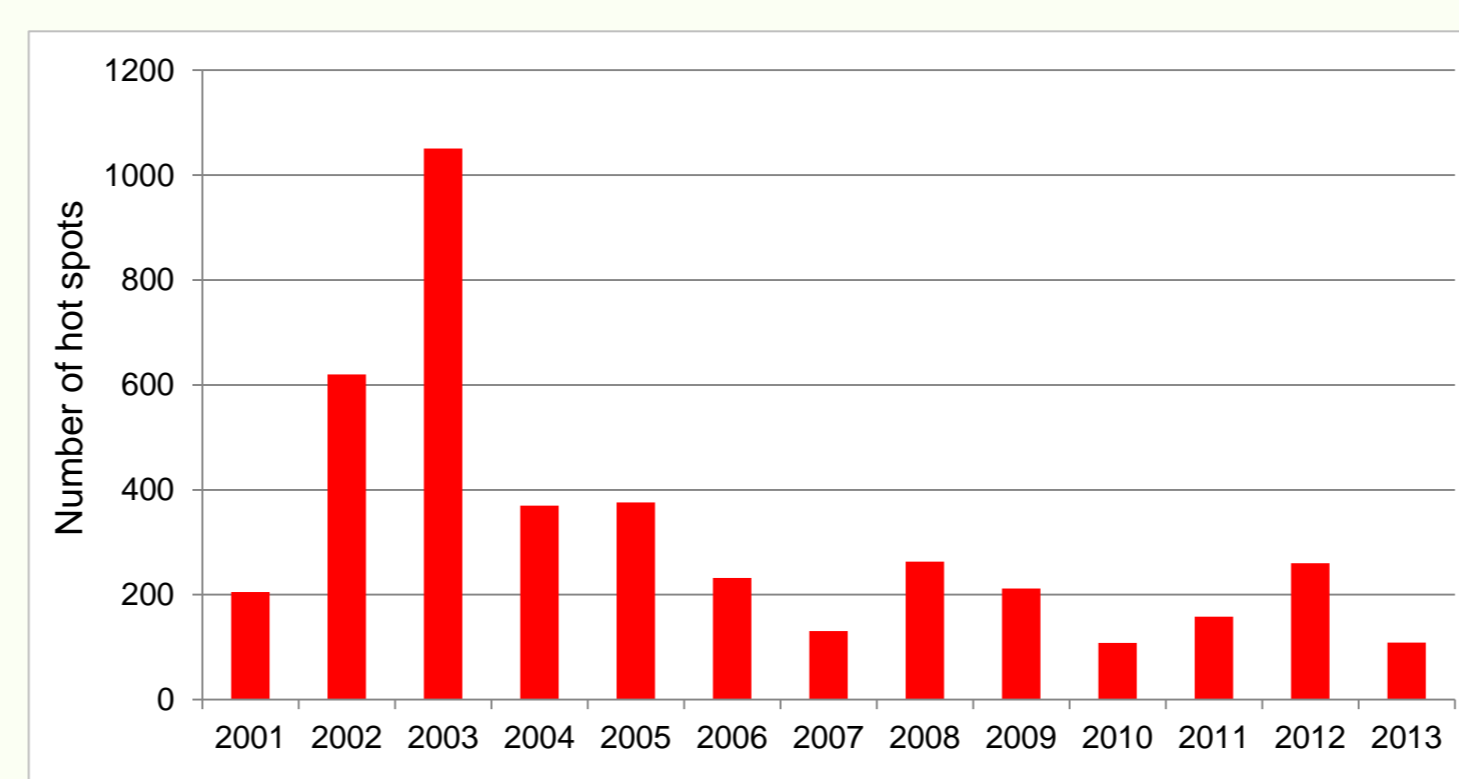


MODIS hot spots

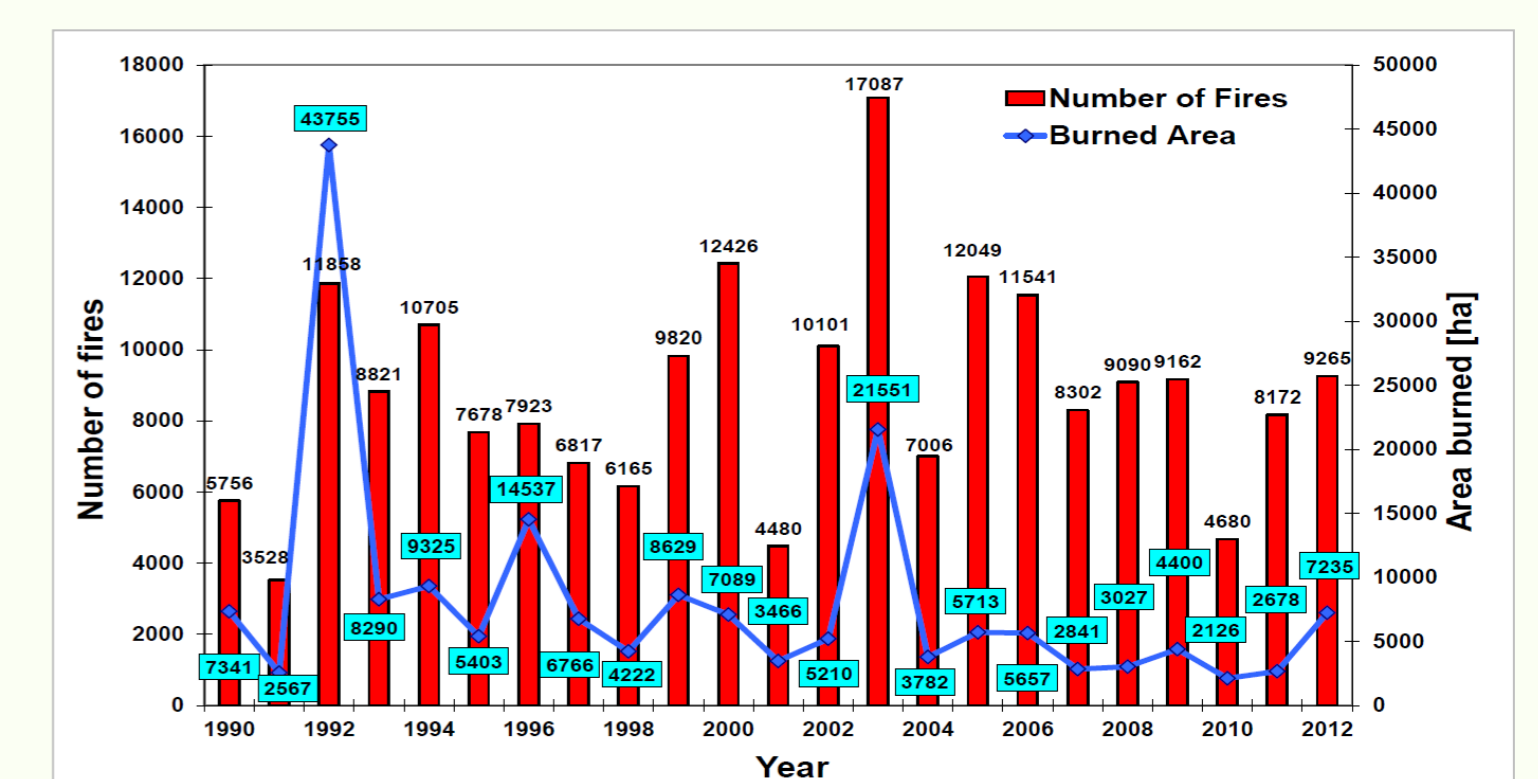
ATSR hot spots



Monthly statistics for hot spots derived from MODIS data for the period 2001-2013

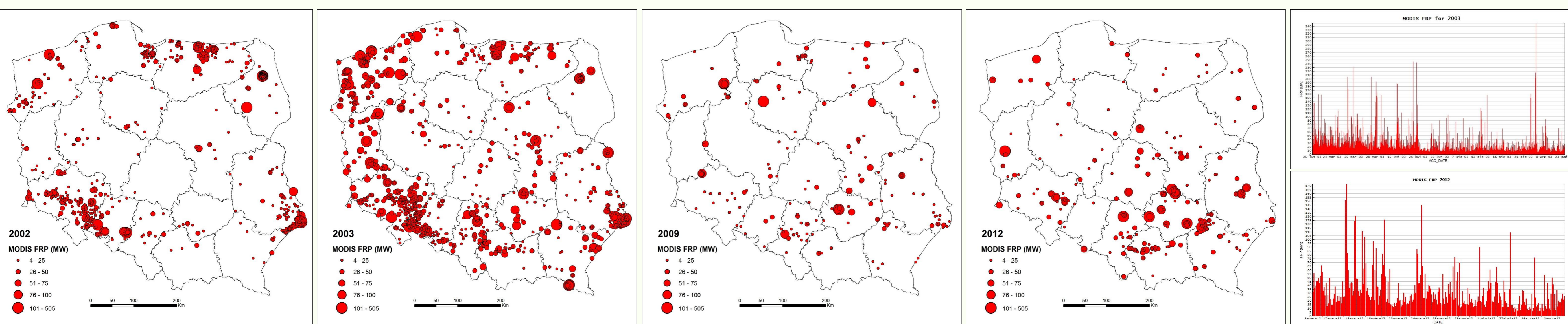


Total number of fires (hot spots) observed by MODIS in Poland for the period 2001-2013



Total number of fires observed on the ground over high forest and area burned in Poland for the period 1990-2012 (source: JRC technical reports: Forest Fire in Europe 2012)

Fire Radiative Power (FRP) provides information on the measured radiant heat output of detected fires. The amount of radiant heat energy liberated per unit time (the Fire Radiative Power) is thought to be related to the rate at which fuel is being consumed. **FRP** is measured in MW (MegaWatts).



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